

CLAIMS

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1. A medical prosthetic device or medical implant containing a metal material (A) selected from the group consisting of titanium or an alloy thereof, zirconium or an alloy thereof, tantalum or an alloy thereof, hafnium or an alloy thereof, niobium or an alloy thereof and a chromium-vanadium alloy, wherein surface parts of the metal material (A) are coated with a layer of a corresponding hydride material (B) selected from titanium hydride, zirconium hydride, tantalum hydride, hafnium hydride, niobium hydride and chromium and/or vanadium hydride, respectively, characterised in that the layer of hydride material (B) comprises one or more biomolecule substances (C) associated therewith.
2. A device or implant as claimed in claim 1 wherein the metal material (A) is titanium or an alloy thereof, preferably titanium.
3. A device or implant as claimed in claim 1 wherein the biomolecule substance (C) is selected from the following types of substances: Natural or recombinant bio-adhesives; natural or recombinant cell attachment factors; natural, recombinant or synthetic biopolymers; natural or recombinant blood proteins; natural or recombinant enzymes; natural or recombinant extracellular matrix proteins; natural or synthetic extracellular matrix biomolecules; natural or recombinant growth factors and hormones; natural, recombinant or synthetic peptide hormones; natural, recombinant or synthetic deoxyribonucleic acids; natural, recombinant or synthetic ribonucleic acids; natural or recombinant receptors; enzyme inhibitors; drugs; biologically active anions and cations; vitamins; adenosine monophosphate (AMP), adenosine diphosphate (ADP) or adenosine triphosphate (ATP); marker biomolecules; amino acids; fatty acids; nucleotides (RNA and DNA bases); sugars.
4. A device or implant as claimed in claim 1 where the biomolecule substance (C) is present on the surface of the hydride material (B) or trapped in the hydride material.
5. A device or implant as claimed in claim 1 where the biomolecule substance or substances (C) is/are associated with the hydride material (B) in an amount from 1 picogram per mm² to 1 mg per mm², preferably from 0.1 nanogram to 100 microgram per mm².

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6. A device or implant as claimed in claim 1 where the biomolecule substance or substances (C) is associated with surfaces that are in contact with bone or other tissue when the device is deployed in the body of a mammal.

7. A device or implant as claimed in claim 1 which replaces anatomy or restores a function of the body such as the femoral hip joint; the femoral head; acetabular cup; elbow including stems, wedges, articular inserts; knee, including the femoral and tibial components, stem, wedges, articular inserts or patellar components; shoulders including stem and head; wrist; ankles; hand; fingers; toes; vertebrae; spinal discs; artificial joints; dental implants; ossiculoplastic implants; middle ear implants including incus, malleus, stapes, incus-stapes, malleus-incus, malleus-incus-stapes; cochlear implants; orthopaedic fixation devices such as nails, screws, staples and plates; heart valves; pacemakers; catheters; vessels; space filling implants; implants for retention of hearing aids; implants for external fixation; intrauterine devices (IUDs); and bioelectronic devices such as intracochlear or intracranial electronic devices.

8. A method for preparing a medical prosthetic device or implant as defined in claim 1, said method comprising subjecting surface parts of the metal material (A) to an electrolysis treatment to form the layer of hydride material (B), said electrolysis treatment being carried out in the presence of one or more biomolecule substances (C).